

97-84082-3

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State and municipal
regulation of radio...

Washington

1929

97-84082-3

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| Box 287 | U. S. Federal radio commission. | |
| | State and municipal regulation of radio communication, by Paul M. Segal and Paul D. P. Spearman of the Legal division, Federal radio commission. Washington, D. C., May, 1929. Washington, U. S. Govt. print. off., 1929. | |
| | iii, 16 p. incl. forms. 23cm. | |
| | Another copy in Law Library. 1929. | |
| | 1. Radio. | ii. Spearman, Paul D. P. |
| | i. Segal, Paul Moses, 1899- | 29-20519 |
| | iii. Title. | |
| | Library of Congress | HES670.U6A4 1929 a |
| | Copy 2. | [29d5] ONLY CD |

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TECHNICAL MICROFORM DATA

FILM SIZE: 35mm

REDUCTION RATIO: 10:1

IMAGE PLACEMENT: IA IIA IB IIB

DATE FILMED: 5-9-97

INITIALS: PB

TRACKING # :

24071

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JUN 6 1929

STATE AND MUNICIPAL
REGULATION

OF

RADIO COMMUNICATION

By

PAUL M. SEGAL

and

PAUL D. P. SPEARMAN

of the Legal Division

FEDERAL RADIO COMMISSION

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FOREWORD

It is not the function of a foreword to embellish or enlarge an article, especially if it deals with a technical subject; but it is worth while to explain briefly the purpose of the article and the standing of the authors.

In a new field of jurisprudence there is occasion for proceeding thoughtfully and deliberately. This is specially true of radio regulation, which must be based on a recognition of sound engineering as well as legal principles. In response to numerous requests for guidance and information, the members of the Legal Division of the Commission feel an obligation to transmit the fruit of their experience to less experienced persons engaged in the formulation of regulatory measures.

Since radio is a new art, there is hope for establishing a uniform and scientific system of control—the chief object in the minds of the authors of this paper. Transmission of intelligence by radio is interstate commerce, and public interest requires Congressional action to administer and conserve the ether for the maximum benefit of the people of the United States. The Radio Act of 1927, as amended, represents the latest Federal statement of the subject. Meanwhile, in recognition of local interests, State legislatures and lesser bodies have framed laws imposing a measure of control on radio transmission and reception and on the use of apparatus causing interference. Some of these measures are legitimate and useful, falling well within the scope of the police power. Some are clearly unconstitutional, since they interfere with Federal regulation. And some unconsciously ignore well-established engineering principles and practices. Without assuming in any sense to dictate local policy, the authors of this paper have outlined the proper scope of local regulation, and they have indicated some of the mistakes, both of policy and of law, which have been innocently incorporated in State statutes and municipal ordinances.

Mr. Segal and Mr. Spearman are well qualified to write on this subject. Apart from their present occupation, which provides unique opportunity to study the subject of radio regulation in all its aspects, they both have a background of experience as general practitioners. Moreover, they are well equipped by study and experience to discuss the engineering aspects of the problem, which form an indispensable basis for all forms of regulation.

BETHUEL M. WEBSTER, JR.,
General Counsel.

STATE AND MUNICIPAL REGULATION OF RADIO COMMUNICATION

The more rapid progress of scientific achievement than of legal control is nowhere better illustrated than in the history of radio legislation. The Act to Regulate Radio Communication, passed August 13, 1912 (37 Stat. 302), which was in effect until 1927, was drawn with a view, among others, to encourage the development of the radiotelephone art. But it never contemplated the magnitude of that development into modern broadcasting. The licensing of stations for radio transmission was placed with the Secretary of Commerce. In *Hoover v. Intercity Radio Co.* (286 Fed. 1003 (1923)), the Court of Appeals of the District of Columbia held that the granting of a station license after proper application was a purely ministerial act and that mandamus would lie to compel the issuance of the license. The Court also held that there was a duty on the part of the Secretary to designate a frequency upon which the station was to operate. Subsequently, in *United States v. Zenith Radio Corporation* (12 F. (2d) 614 (1926)), the United States District Court for the Northern District of Illinois held that under certain of the criminal provisions of the Act, a station owner could not be punished for disregarding the frequency assignment of the Secretary of Commerce.

The entire question was referred to the Attorney General of the United States. On July 8, 1926, he gave it as his opinion that the Act of 1912 was a "direct legislative regulation of the use of wave lengths" and that the Secretary of Commerce had no general authority to limit the time during which stations might operate, the amount of power they might use, or to specify the frequency band which they might occupy (35 Op. 126).

This extended the so-called breakdown of the law. The great number of broadcasting stations, their conflicting desires, and the selfishness of many of them, all coupled with the inability of the Secretary of Commerce to refuse licenses or to restrict their utilization, brought about an intolerable condition of chaos and interference in the broadcast portion of the spectrum. For a long time experts and those in authority had indicated that new legislation was required. The dramatic breakdown of the law brought this opinion forcefully into the public mind and a powerful sentiment developed in favor of new legislation.

Congress passed the Act for the Regulation of Radio Communications and for Other Purposes, which was approved February 23, 1927 (44 Stat. 1162). As this Act provided for the creation of a Federal Radio Commission which is compelled to proceed cautiously and only after careful study and which is of necessity limited in its activities by physical and scientific factors, it is evident that the Act of 1927 was no immediate satisfaction of popular demand for control.

The demand therefor broke through its most accessible outlet—municipal legislative bodies. The flow continues even now that the Federal Radio Commission has, by its broadcasting station reallocation effective November 11, 1928, greatly ameliorated conditions of reception.

Attempted State and municipal control, while in a large measure springing from a desire to improve reception conditions, is now broadening its scope, taking innumerable forms.

The earliest such legislation was enacted as long ago as January, 1923, by the city of Atchison, Kans. The ordinance of that city provides penalties for anyone "unnecessarily and electrically disturbing the atmosphere within the limits of the city . . . by any means whatsoever not necessarily incident to the operation of some device, mechanism, or apparatus used and useful in any business, trade, or occupation." The city attorney of Atchison subsequently interpreted this ordinance as not applicable to federally licensed transmitters.

In 1923, Minot, N. Dak., enacted an ordinance embodying, in effect, the provisions of the Atchison ordinance and in addition imposing certain quiet hours upon amateur stations which quiet hours were more stringent than and in conflict with the regulations of the Department of Commerce.

On October 1, 1926, Wilmore, Ky., passed an ordinance imposing an annual license tax of \$100 upon "all owners or operators of each broadcasting or radio-casting station operated within the limits of the city . . ."

Minneapolis, Minn., on February 11, 1927, enacted an ordinance imposing a similar license tax, prescribing the location of stations with reference to their interference-producing possibilities, and seeking to eliminate electrical interference with radio reception. The Minneapolis ordinance is probably the most extensive now in effect.

Since it was passed, the field of attempted regulation by local entities has been almost indefinitely extended.

The wide range of radio laws enacted by States and municipalities is shown by the following classification of some now in effect:

- I. Laws providing direct local control of radio transmission or apparatus, such as those—
 - A. Prescribing local licenses or privilege taxes.¹
 - B. Limiting the operation of reception apparatus.²
 - C. Restricting the hours of transmission.³
 - D. Dealing with the location of transmission equipment—
 1. To prevent the type of interference known as "blanketing" (laws limiting the power output of transmitters).⁴
 2. To make zoning laws applicable to radio towers and buildings.⁵

¹ Municipalities: Kentucky, Wilmore, ordinance No. 43, Oct. 1, 1926 (held unconstitutional, enforcement enjoined, *Whitehurst v. Grimes et al.*, 21 F. (2d) 787d (1927)); Minnesota, Minneapolis, ordinance of Feb. 11, 1927, Secs. II-III, as amended May 13, 1927. The following may be interpreted as within this class: Oregon, Marshfield, ordinance No. 1220, Mar. 7, 1927; Roseburg, ordinance No. 904, Apr. 4, 1927.

States: Maine, ch. 215, Public Laws, 1927, Apr. 16, 1927; Michigan, Act No. 131, Public Acts, 1927, sec. 4. *Municipalities: California, Los Angeles.*

² States: Michigan Act No. 131, Public Acts, 1927, secs. 1-3. *Municipalities: Indiana, Franklin, ordinance No. 427, Feb. 2, 1928 (as to all types of transmission except "broadcasting"); Minnesota, Minneapolis, Feb. 11, 1927, Sec. V. The following may be interpreted as within this class: California, Santa Ana; Indiana, Bloomington, Feb. 1, 1928; Iowa, Fairfield, ordinance No. 252, Jan. 3, 1928; Louisiana, Bunkie; North Dakota, Minot; Oregon, Marshfield, ordinance No. 1220, Mar. 7, 1927; Roseburg, ordinance No. 904, Apr. 4, 1927.*

³ *Municipalities: Minnesota, Minneapolis, Feb. 11, 1927, Sec. IV; North Dakota, Minot, sec. 3.*

⁴ This prevails in many cities. Some classify a radio broadcasting station as a business, others as an industrial use.

E. Extending the State's control over public utilities to radio transmission.⁶

F. Concerning themselves with the subject matter of radio transmission.⁷

II. Antinuisance laws.

A. For the control of locally originating electrical interference with radio reception.⁸

B. For the control of loud-speaker operation.⁹

III. Laws dealing with apparatus construction.

A. As to towers, poles, guy wires, antennas, etc.¹⁰

B. As to wiring (fire hazards).¹¹

Even this classification is more illustrative than inclusive. Many of the ordinances include the features of a number of the classifications.

It is the plan of this paper to follow this classification in a discussion of these ordinances as to (a) their validity and (b) their policy.

I

LAWS PROVIDING DIRECT LOCAL CONTROL OF RADIO TRANSMISSION OR APPARATUS

Certain legal considerations immediately suggest themselves in the consideration of legislation of this character.

By enactment of the Radio Act of 1927, supra (as well as by prior acts of Congress), the United States Government assumed the regulation of radio communication as a nation-wide problem admitting of and requiring a uniform system of regulation and created the Federal Radio Commission to administer the law.

⁶ States: Michigan, Public Acts, 1927, No. 131; Nevada, Act of Mar. 28, 1919 (see sec. 7 of Act as amended by ch. 28, Acts of 1928).

⁷ States: Illinois, Cahill's Revised Statutes, 1927, ch. 38, p. 936 (extending the libel law to slanders uttered over radio stations); Minnesota, Mason's Minnesota Statutes, 1927, sec. 9930-16 (requiring the broadcasting of information helpful in locating stolen property and the dissemination of information as to wrongdoers wanted).

⁸ States: Maine, ch. 215, Apr. 16, 1927. *Municipalities: California, Crescent City, Los Angeles, Santa Ana; Indiana, Bloomington, Feb. 21, 1928; Franklin, ordinance No. 427, Feb. 2, 1928; Iowa, Storm Lake (failed of State ratification, 1928); Kansas, Atchison (1923); Louisiana, Bunkie; Michigan, Bay City, Feb. 15, 1929, City of Two Harbors, Iron River, Munroe; Minnesota, Minneapolis, Feb. 11, 1927, Sec. VII, St. Paul; Nebraska, Lincoln; New York, Boonville, Jan. 21, 1929; North Dakota, Minot, secs. 1-2; Oklahoma, Durrigh; Oregon, Marshfield, ordinance No. 1220, Mar. 7, 1927; Roseburg, ordinance No. 904, Apr. 4, 1927; Portland, ordinance No. 51269, Jan. 12, 1927, as amended by ordinance No. 51714, Mar. 23, 1927; Virginia, Waynesboro; Washington, Spokane, ordinance No. C 4237, May 7, 1928; Wisconsin, Antigo, Nov. 28, 1928, Ashland, North Fond du Lac, Oshkosh, Stevens Point, Mar. 6, 1928, Watertown, Wausau, ordinance No. 68, Nov. 7, 1928.*

⁹ *Municipalities: California, Oakland, ordinance No. 2199 NS, Dec. 1, 1921; Michigan, Detroit, ordinance No. 243B, sec. 6, June 8, 1926.*

¹⁰ States: Wisconsin, orders Nos. 1393-1399, State Electrical Code. *Municipalities: California, Berkeley, ordinance No. 1469 NS, Sept. 11, 1928; San Diego, sec. 248, Building Code; District of Columbia, Building Code, pp. 12, Sec. III, p. 108; Maryland, Baltimore, sec. 6, Appendix A, p. 1178, City Code of 1927; Michigan, Flint, ordinance No. 38, Aug. 28, 1922; Missouri, St. Louis, ordinance No. 33135, sec. 250, Revised Code of 1926 (see also "Model Ordinance" in Report No. 346, New York State Bureau of Municipal Information, April 3, 1925).*

¹¹ *Municipalities: Missouri, St. Louis, ordinance No. 33135, sec. 250, Revised Code of 1926; New York, New York; Ohio, Cleveland, ordinance No. 58781A (sec. 1736A of the code), sec. 6, transmitters, sec. 7, receivers. (See also the recommendations of art. 37, Code of National Board of Fire Underwriters; see also "Model ordinance" in Report No. 346, New York State Bureau of Municipal Information, Apr. 3, 1925.)*

RADIO COMMUNICATIONS ARE ALL INTERSTATE COMMERCE REGARDLESS OF WHETHER THEY ARE INTENDED FOR RECEPTION BEYOND THE STATE AND REGARDLESS OF ANY QUESTION OF PROFIT

In *Whitehurst v. Grimes* (21 F. (2d) 787), the court held:

Radio communications are all interstate. This is so, though they may be intended only for intrastate transmission; and interstate transmission may be seriously affected by communications intended only for intrastate transmission. Such communications admit of and require a uniform system of regulation and control throughout the United States, and Congress has covered the field by appropriate legislation.

In *United States v. American Bond and Mortgage Co. et al.* (31 F. (2d), 448 (D.C., N.D., E.D., Ill.), 1929) Judge Wilkerson, in a very able opinion, said:

It does not seem to be open to question that radio transmission and reception among the States are interstate commerce. To be sure, it is a new species of commerce. Nothing visible or tangible is transported. There is not even a wire over which "ideas, wishes, orders, and intelligence" are carried. A device in one State produces energy which reaches every part, however small, of the space affected by its power. Other devices in that space respond to the energy thus transmitted. The joint action of the transmitter owned by one person and the receiver owned by another is essential to the results, but that result is the transmission of intelligence, ideas, and entertainment. It is intercourse and that intercourse is commerce. (*Gibbons v. Ogden*, 9 Wheat. 1, 68; *Pensacola Telegraph Co.*, 96 U. S. 1, 9; *Western Union Telegraph Co. v. Pendleton*, 122 U. S. 347, 356; *International Text Book Co. v. Figg*, 217 U. S. 91, 106, 107.)

(See also 24 Op. 100, 101; *Marconi Wireless Telegraph Company of America v. Commonwealth*, 218 Mass. 558; *Minnesota Rate Case*, 230 U. S. 352; *American Express Co. v. United States*, 212 U. S. 522.)

SINCE RADIO COMMUNICATION IS INTERSTATE COMMERCE AND IT ADMITS OF AND REQUIRES A UNIFORM SYSTEM OF CONTROL THROUGHOUT THE NATION, IF NOT THROUGHOUT THE ENTIRE WORLD, THIS CONTROL IS VESTED EXCLUSIVELY IN CONGRESS AND ITS AGENCIES TO THE EXCLUSION OF THE SO-CALLED POLICE POWER OF THE STATES

That radio requires uniform national and international control is apparent from even a passing consideration of the art. "Radio waves know no frontiers." They have been the subject of repeated international conferences dating from 1906. A 5-kilowatt broadcasting installation anywhere in the United States has an interference range extending beyond the borders of the country. In the frequencies above 6,000 kilocycles, transmissions using less power than that of a small electric light bulb are heard around the world. Allocations of frequency and power to stations must produce severe interference unless they are made part of a generally interrelated allocation of national scope. Where power or frequency gives a station international effect, its assignment is registered with the International Bureau at Berne.

In *the Case of the State Freight Tax* (15 Wall 232, 21 L. ed. 146) the court held:

... the rule has been asserted with great clearness, that whenever the subjects over which a power to regulate commerce is asserted are in their nature national, or admit of one uniform system or plan of regulation, they may justly be said to be of such a nature as to require exclusive legislation by Congress. (Citing a number of cases.)

(See also *Henderson et al. v. Mayor of New York et al.*, 92 U. S. 259, 23 L. ed. 543.)

In *Walling v. Michigan* (116 U. S. 446, 29 L. ed. 691) Mr. Justice Bradley, speaking for the Court, at page 455, said:

We have so often held that the power given to Congress to regulate commerce with foreign nations, among the several States, and with the Indian tribes is exclusive in all matters which require, or only admit of, general and uniform rules, and especially as regards any impediment or restriction upon such commerce, that we deem it necessary only to refer to our previous decisions on the subject, the most important of which are collected in *Brown v. Houston* (114 U. S. 622, 631) and need not be cited here. We have also repeatedly held that so long as Congress does not pass any law to regulate such commerce among the several States, it thereby indicates its will that such commerce shall be free and untrammelled; and that any regulation of the subject by the States, except in matters of local concern only is repugnant to such freedom. (*Welton v. Missouri*, 91 U. S. 275, 282; *County of Mobile v. Kimball*, 102 U. S. 691, 697; *Brown v. Houston*, 114 U. S. 622, 631.)

There are numerous decisions of the Supreme Court holding that when the thing to be regulated admits of a uniform nation-wide system of regulation, and has been declared to be, and is, interstate commerce, and Congress enacts a law to regulate it under the commerce clause of the Federal Constitution, that the States have no authority to enact laws which would interfere with Federal regulation. In the case of *United States v. American Bond and Mortgage Co. et al.*, supra, it was said:

The authority of Congress extends to every instrumentality or agency by which commerce is carried on; and the full control of Congress of the subjects committed to its regulation is not to be denied or thwarted by the commingling of interstate and intrastate operation. The execution by Congress of its constitutional power to regulate interstate commerce is not limited by the fact that intrastate transactions may have become so interwoven therewith that the effective government of the former incidentally controls the latter. This conclusion necessarily results from the supremacy of the national power within its appointed sphere. (*Simpson et al. v. Shepard*, 230 U. S. 352, 399, and cases cited.)

When Congress enacts a law to regulate any phase of interstate commerce, such Federal law has plenary control over the subject and supersedes any State law which may be in conflict with it. (*Gibbons v. Ogden*, 9 Wheaton 1, 6 L. ed. 23.)

With these considerations in mind an approach may be made to the various types of ordinances in Group I.

(I. *Laws providing direct local control of radio transmission or apparatus, such as those—*)

A. PRESCRIBING LOCAL LICENSES OR PRIVILEGE TAXES

Such ordinances are void. No tax may be levied by States or municipalities on the privilege of engaging in the business of transmitting or receiving radio communications. Both transmission and reception are required to carry on communication. Neither can be dispensed with. Each is essential to intercourse and both a transmitter and receiver are indispensable in effecting interstate commerce. A privilege tax on transmitting or receiving would be a tax on an indispensable instrumentality of interstate commerce. The right of a State to collect such a tax is denied in *Atlantic and Pacific Telegraph Co. v.*

Philadelphia (190 U. S. 160, 47 L. ed. 995). The Court, speaking through Mr. Justice Brewer, said:

No State can compel a party, individual, or corporation to pay for the privilege of engaging in interstate commerce. (*Gloucester Ferry Co. v. Pennsylvania*, 114 U. S. 196, 211; *Pickard v. Pullman Car Co.*, 117 U. S. 34; *Robbins v. Shelby Taxing District*, supra; *Fargo v. Michigan*, 121 U. S. 230, 245; *Philadelphia Steamship Co. v. Pennsylvania*, 122 U. S. 326; *Leloup v. Port of Mobile*, supra; *Asher v. Texas*, 128 U. S. 129; *Lyng v. Michigan*, 135 U. S. 161, 166; *McCall v. California*, 136 U. S. 104, 113; *Crutcher v. Kentucky*, supra; *Adams Express Company v. Ohio*, 165 U. S. 194, 220.)

Other cases to the same effect are *Barrett v. City of New York* (232 U. S. 14, 58 L. ed. 483); *Postal Telegraph Co. v. Adams* (155 U. S. 688, 39 L. ed. 311); *Leloup v. Port of Mobile* (127 U. S. 640, 32 L. ed. 311); *Western Union Telegraph Co. v. Kansas* (216 U. S. 1, 54, L. ed. 355); *Ozark Pipe Line Corporation v. Monier et al.* (266 U. S. 555, 69 L. ed. 439).

In the last-mentioned case the Court said at page 562:

It long has been settled that a State can not lay a tax on interstate commerce in any form, whether on the transportation of subjects of commerce, the receipts therefrom, or the occupation or business of carrying it on.

And in *Whitehurst v. Grimes, et al.*, supra, the United States District Court for the Eastern District of Kentucky held void the Wilmore privilege tax ordinance above described.

B. LAWS LIMITING THE OPERATION OF RECEPTION APPARATUS

A long-recognized source of interference with radio reception is the so-called oscillating or radiating receiver. There are several statutes referred to above which attempt to eliminate this source of interference by direct prohibition.

A consideration of the policy of such statutes immediately shows them to be impossible of enforcement.

They are directed against a whistling sort of interference with radio reception. So-called radio-frequency impulses which are received on a radio set are at a pitch far beyond the range of the human ear. The speech, music, or other signal is taken from a "carrier wave" and "detected" to make it audible. While a radio-frequency impulse can not be heard, the beat note or heterodyne—that is, the difference between two such impulses (where the difference, mathematically expressed in cycles, is of the audible range)—is audible as a growling or whistling noise. But these beat notes may be produced in a receiving apparatus by a joint operation of:

- (a) Two broadcasting stations.
 - (b) One broadcasting station and a neighbor's receiving apparatus.
 - (c) One broadcasting station and the oscillations of one's own receiving apparatus.
 - (d) A neighbor's and one's own receiving apparatus.
 - (e) The receiving apparatus of two neighbors.
- Also, the following types of receiving apparatus may oscillate or produce radio-frequency impulses:
- (a) Regenerative receiving sets.

(b) Receiving sets containing oscillating tubes, such as superheterodyne sets.

(c) Radio-frequency-amplifier receiving sets when out of adjustment or improperly operated.

In short, almost every receiving set is potentially a source of this type of interference.

From a consideration of these factors it is perfectly plain that a complaint of the violation of such a statute could scarcely be traced and never be proved in court. The matter is one which has the thorough and careful consideration of set manufacturers. A set which is capable of interfering with the reception of others will also interfere with its own reception. Manufacturers are therefore compelled to eliminate this difficulty as rapidly as the state of the art permits. It requires no legislation.

Considered from the standpoint of validity, these statutes present a problem of great interest. A receiving apparatus is an indispensable instrumentality of commerce. Whether the State can legislate with reference to oscillations by a receiving apparatus depends upon whether those oscillations are necessary to reception. If they are necessary, in an individual apparatus, the statute is a restriction of interstate commerce. If they are unnecessary, the statute is an aid to commerce and the responsibility of the set owner for violation of the statute depends upon his knowledge or the reasonable possibility of his knowledge of the existence of the oscillations. The prospect of the trial of such matters in an average police or municipal court is nothing short of appalling.

C. LAWS RESTRICTING THE HOURS OF TRANSMISSION

Considered from the standpoint of policy this type of law is an anachronism. Motive for it may reasonably have existed during the period of law "break-down" referred to above. Then stations within a city which were but slightly separated in frequency might have operated simultaneously to the disgust of all persons hearing the resulting scramble of sounds. Then, also, local stations of high power and poor frequency control occupied wide territory in the spectrum to the exclusion of all programs from a distance.

To-day the Federal Radio Commission is curing these troubles as rapidly and as thoroughly as the state of the radio art permits.

Quiet hours were also provided by some ordinances to eliminate interference with broadcast reception from some amateur transmitting installations. Amateurs comprise the numerically greatest group of license holders. They transmit for purposes of experimentation, study, public accommodation, emergency communications, and training for the national defense. Their frequencies are widely separated from those used in broadcasting. Years ago the so-called spark set of the amateur occupied a territory extending over a large part of the frequency spectrum and could not be excluded by the then used type of receiving set. But the development of new types of transmitters by the amateurs and of new types of receivers for broadcast listeners has brought an end to this problem. There can be no need for legislation.

In any event, all local legislation with reference to quiet hours is invalid. As was indicated above, this is a function exclusively of Congress and its in-

strumentalities. The Federal Radio Commission has fully covered the field. Of the general orders of the commission now in effect, nine deal generally with this question. The license of each station contains specific provisions as to hours of operation, the violation of which provisions constitutes grounds for license revocation. A further consideration of the effect of quiet-hour legislation shows its invalidity in another respect. An ordinance of a city in the central standard time zone requiring communicating stations to observe quiet hours of from 7 p. m. to midnight would deprive stations on the Atlantic coast of the opportunity to communicate with it from 8 p. m. to 1 a. m., and stations on the Pacific coast would be similarly affected from 5 until 10 p. m. Such nation-wide legislation is of course far beyond any conceivable power of a municipality.

D. LAWS DEALING WITH THE LOCATION OF TRANSMISSION EQUIPMENT

This classification has been divided into two portions, the first of which is—

1. TO PREVENT THE TYPE OF INTERFERENCE KNOWN AS "BLANKETING"

This classification includes laws limiting the power output of transmitters within the municipality or designated portions thereof.

In this instance, also, we have a municipal attempt to legislate on a matter now being satisfactorily handled by Federal control and which is also a problem of engineering development rather than legislation.

"Blanketing" is that type of interference existing in a receiver wherein the signals of a powerful and near-by transmitter appear to be so loud and so widespread as to render unsatisfactory the reception of other signals on near-by channels.

In this connection, the first consideration must be the fact that "blanketing" is a function or characteristic of the receiving apparatus and not of the particular transmitter and, as a matter of receiver design, this feature is necessary to a certain extent. A receiving apparatus may be constructed to select its reproduced frequencies over a broad or a narrow band. The broadly tuned receiving apparatus is plainly more subject to "blanketing" than the narrowly tuned apparatus. But broadcast stations do not transmit on a single frequency. The carrier frequency is modulated in ordinary transmission to the extent of 5 kilocycles on either side of the frequency and it is necessary for a good receiver at one time to receive a band of frequencies 10 kilocycles wide. In construction the receiver can not now be so definitely limited and hence it receives, at lessening amplitudes, a much wider band. The engineering problems involved in the design of receiving apparatus are extremely difficult in this aspect and certainly, municipal legislation with reference to station power and location can be of no assistance in the solution of the problems.

The Federal Radio Commission has covered the field of the location of transmitting apparatus. Each license specifies an exact location. A station may not move unless it secures the modification of its license in this regard. The commission acts in the licensing of stations under the standard of the public

interest, convenience, and necessity. In a discussion of its understanding of those terms the commission, on August 23, 1928, said:

Another question which must be taken seriously is the location of the transmitter of the station. This is properly a question of interference. Generally speaking, it is not in the public interest, convenience, or necessity for a station of substantial power (500 watts or more) to be located in the midst of a thickly populated community. The question of the proper location of a station with respect to its power is a complicated one and can not here be discussed in detail. Obviously, it is desirable that a station serving a particular community or region should cover that community or region with a signal strong enough to constitute adequate service.

It is also desirable that the signal be not so strong as to blanket reception from other stations operating on other frequencies. There is a certain amount of blanketing in the vicinity of every transmitter, even one of 5, 10, or 50 watts. The frequencies used by stations in the same geographical region can be widely enough separated, however, so that the blanketing will not be serious from a transmitter of less than 500 watts, even when located in a thickly inhabited community. With stations of that amount of power, or greater, the problem becomes a serious one. In order to serve the whole of a large metropolitan area, a 500-watt station has barely sufficient power even when it is located in the center of the area. If its transmitter is located away from the thickly inhabited portions and out in the country it will not give satisfactory service. Such an area can only be adequately served, without blanketing by stations of greater power located in sparsely settled portions of the near-by country.

Theoretically, therefore, it may be said that it will not serve public interest, convenience, or necessity to permit the location of a low-powered station in a large city. It can not hope to serve the entire city, and yet it renders the frequency useless for the listeners of the city outside of the small area immediately surrounding the station. On the other hand, such a station might give very good service to a small town or city. (*Annual Report, Federal Radio Commission, 1928, p. 169.*)

Such ordinances, therefore, are invalid in view of the general legal principles above discussed, coupled with the fact that the Commission is dealing fully with the problem.

2. TO MAKE ZONING LAWS APPLICABLE TO RADIO TOWERS AND BUILDINGS

Where the purpose of an ordinance is to prevent the erection of unsightly towers and buildings in a residential or restricted neighborhood, and where the ordinance is drawn to have only that effect without prescribing the location of the station as such, it would seem that the ordinance would be valid within the limitations generally applicable to zoning ordinances. The policy of such an ordinance is a matter of local concern.

E. LAWS EXTENDING STATE CONTROL OVER PUBLIC UTILITIES TO RADIO TRANSMISSION

As these statutes seem to concern themselves only with broadcasting stations, we discuss that application only.

It is true that radio broadcasting stations are licensed in "public interest, convenience, or necessity," a phrase borrowed by the Congress from public utility law. But from this, as has been repeatedly pointed out by the Commission, it does not follow that the broadcasting station is held out, either by itself or by the law, as a public utility for the transmission of broadcasts. It

is a public utility from the standpoint of the reception of broadcasts. The dedication to the public of a radio program when it is transmitted by a broadcast station, the present impossibility of limiting its reception, and the necessity that the programs be so arranged as to interest the entire community—these are the things wherein the public utility aspect of radio broadcasting appears.

In its statement filed with the Court of Appeals for the District of Columbia in the WENR, WLS, and WCBD appeals, the Commission said:

As an instrument for the communication of intelligence, a broadcasting station has frequently been compared to other forms of communication, such as wire telegraphy or telephony, or point-to-point wireless telephony or telegraphy, with the obvious distinction that the messages from a broadcasting station are addressed to and received by the general public, whereas toll messages in point-to-point service are addressed to single persons and attended by safeguards to preserve their confidential nature. If the analogy were pursued with the usual legal incidents, a broadcasting station would have to accept and transmit for all persons on an equal basis without discrimination in charge, and according to rates fixed by a governmental body; this obligation would extend to anything and everything any member of the public might desire to communicate to the listening public, whether it consists of music, propaganda, reading, advertising, or whatnot. The public would be deprived of the advantage of the self-imposed censorship exercised by the program directors of broadcasting stations who, for the sake of the popularity and standing of their stations, will select entertainment and educational features according to the needs and desires of their invisible audiences. In the present state of the art there is no way of increasing the number of stations without great injury to the listening public, and yet thousands of stations might be necessary to accommodate all the individuals who insist on airing their views through the microphone. If there are many such persons, as there undoubtedly are, the results would be, first, to crowd most or all of the better programs off the air; and second, to create an almost insoluble problem—i. e., how to choose from among an excess of applicants who shall be given time to address the public and who shall exercise the power to make such a choice.

To pursue the analogy of telephone and telegraph public utilities is, therefore, to emphasize the right of the sender of messages to the detriment of the listening public. The Commission believes that such an analogy is a mistaken one when applied to broadcasting stations; the emphasis should be on the receiving of service and the standard of public interest, convenience, or necessity should be construed accordingly.

Neither the Federal Radio Commission nor the Radio Act of 1927, as amended, places a broadcast station in the classification of a public utility from the standpoint that the station is compelled to sell time on the air to any and all persons desiring to purchase it, for any and all purposes and any and all types of use. Such a requirement would carry within it the germs of the destruction of American system of broadcasting.

The attempted imposition by States upon broadcasting stations of a standard different from that of Federal law is invalid.

F. LAWS CONCERNING THEMSELVES WITH THE SUBJECT MATTER OF RADIO TRANSMISSION

The authority of the Federal Radio Commission over the subject matter of a radio broadcast is limited by the provisions of section 29 of the Radio Act of 1927 which provides only against the use of "obscene, indecent, and profane language." The section provides that nothing in the Act shall be understood

or construed to give the licensing authority the power of censorship or the power to interfere with the right of free speech.

Under other sections of the Act, the Commission, in determining whether the renewal of a station license is in the public interest, convenience, or necessity, may consider the type of programs and the character of utterances promulgated by the station.

So far as concerns defamatory matter, the common law distinctions between libel and slander (both as to criminal and civil responsibility) seem to be based upon the more permanent nature and the wider dissemination of libelous statements. The invention of radio broadcasting has created a means of giving to oral defamatory utterances a wideness of circulation greater than that now generally given to written defamations. A statute such as that of Illinois, *supra*, which extends the law of libel to radio broadcast defamation is well within the modern legislative spirit, and may well be enacted anywhere provided problems of extraterritorial legislation are avoided.

There are also statutes requiring stations located within a State to do certain broadcasting for the State or its police department. In other fields of commerce, such statutes, being of a local character and designed for the safety and welfare of the residents of the locality, would be held valid. It being, however, the essential nature of radio transmissions that they are all interstate, the validity of such a statute would be questionable, particularly if the matter required to be broadcast were extensive.

II. ANTINUISANCE LAWS

A. FOR THE CONTROL OF LOCALLY ORIGINATING ELECTRICAL INTERFERENCE WITH RADIO RECEPTION

Interference with radio reception has been classified as (a) radio, (b) atmospheric, and (c) inductive. Interference springing from radio sources, transmitting and receiving apparatus, has been discussed above in connection with statutes seeking to relieve it. Atmospheric interference, or "static," inheres in the medium we are compelled to use for transmission. Some scientific experimentation has taken place with "static filters," but as yet there is no instance of municipal legislation to regulate this problem.

The classification of inductive interference includes all interference originating with devices of a nonradio character which by reason of their essential nature or certain imperfections in the devices causes them to emit impulses which become audible in a radio-receiving apparatus. (The use of the word "inductive" in this connection comes only from the lack of a better. The word is here used in a very broad sense.) The prevention, tracing, and cure of such interference is the subject of a considerable technical literature.

The legislative attack on this type of interference comprises the great majority of local enactments on radio subjects. The statutes seek variously to prohibit the use of such devices, to restrict their operation to certain hours of the day, or to compel the attachment to them of certain corrective devices known as "chokes" or "filters."

Inductive radio interference is of three general classes, (a) from defects in electrical power transmission circuits, (b) from certain industrial uses of electricity, and (c) from electrical appliances used in the household, store, and office.

It should be considered whether there is a necessity for legislation in any of these three classes of cases.

(a) INTERFERENCE FROM DEFECTS IN ELECTRICAL POWER TRANSMISSION CIRCUITS

Occasionally slight breaks occur in an electrical power-transmission line whereby a condition of continuous sparking occurs. (A continuous electrical spark frequently becomes an arc.) The occurrence of such a condition in the direct line of the circuit is rare and more frequently the arc takes place as a partial short-circuit across two wires or from one wire to ground through the medium of a defective insulator, a broken branch, a damp pole, a "leaky transformer," or some similar path. Such an arc is in effect a radio transmitter and it gives out impulses which cause interference with reception. These impulses are carried along the lines of the power company in the same manner as the so-called wired wireless. They cause an interference with radio receiving apparatus along the entire circuit. This interference varies inversely according to the distance between the receiving apparatus and the nearest conducting wire and according to the angle between that wire and the antenna of the receiving apparatus. It is affected by the type of receiving apparatus and innumerable other factors.

It must be remembered that such a condition of interference springs from a cause which represents a direct financial loss to the power company. As the matter was aptly stated by one power company executive, "We are interested in selling power, not broadcasting it." These companies are interested in the correction of power leaks independent of the question of interference. Their location involves investigation and study, the collection of data as to complaints along the many portions of the circuit, and an analysis of the circuit diagrams. Power companies all over the country maintain departments for the correction of interference. The internal economy of their organizations as well as the maintenance and development of public good will require it.

For this purpose, electric railways may be considered as power-distribution companies. They have similar problems.

Obviously, no penal or criminal legislation is a proper method of dealing with the situation.

There is another type of power-transmission interference caused by direct induction. It is a physical law that when there are two close and parallel conductors, in one of which an alternating electrical current flows, a voltage is induced in the other causing a similar current flow there. Hence, if the receiving antenna of a radio apparatus is erected close and parallel to a power transmission line, a hum of the order of the line frequency will be caused in the receiving apparatus. This form of interference has received judicial consideration as between public utility lines in the following cases: *Paris Electric, etc., Co. v. Southwestern Telephone and Telegraph Co.* (1894), 27 S. W. (Tex.), 902; *Nebraska Telephone Co. v. York Gas Co.* (1889), 27 Nebr. 284; *Western*

Union Telegraph Co. v. Los Angeles Electric Co. (Circuit Court, S. D. California, 1896), 76 Fed. 178.

As it concerns radio reception, however, the solution is a simple one; antennas should not be so constructed. Legislation could not compel the removal or reconstruction of an expensive transmission line merely in the interest of individual radio-set owners, nor could it prevent the construction of such a line.

(b) INTERFERENCE FROM CERTAIN INDUSTRIAL USES OF ELECTRICITY

There are also industrial activities which cause interference with radio reception. For example, "precipitator" devices, which are designed to control smoke and noxious fumes by the creation of an intense electrical field within the stack, are, in effect, radio transmitters. Interference is also caused by arc welders, portable drills, motors and generators, bell ringers, thermostats, and starting contacts.

Practically all these devices can be cured of their interference effects by repair or the addition of filtering attachments. In this connection, each industry is greatly concerned with the maintenance of public good will as well as efficiency in its own processes. The occasion when a manufacturer refuses to correct an abuse once it is called to his attention is so rare that certainly mere local legislation is not the most effective weapon. Instances are known to every radio trades association where manufacturers have gone to expense aggregating thousands of dollars purely for the purpose of eliminating radio interference. Surely, it would not be expected that merely because of the passing of an ordinance by a community, an industry should go to prohibitive expense.

Individual plants which can not be brought to voluntary or cooperative control may be treated as is suggested in the next following classification.

(c) INTERFERENCE FROM ELECTRICAL APPLIANCES USED IN THE HOUSEHOLD, STORE, AND OFFICE

The spark and the arc, together with their accompanying radio interference, are found in hundreds of appliances in common use. In some such appliances the disturbance is a necessary part of the apparatus. Examples of this are X ray, violet ray, and diathermic machines.

In these cases radio interference is cured or prevented by the insertion of attachments which prevent the flow of the radio-frequency impulses back into the power lines for general dissemination. In other devices, the interference is not necessarily produced by the operation of the device and is due only to improper design or to a defect which has developed. Devices of this character are heating pads, vibratory battery chargers, electric sign "flashers," and motors and controls such as those used in vacuum cleaners, electric refrigerators, washing machines, elevators, and innumerable other devices.

The holding of a householder to a criminal or penal responsibility because of the mere ownership or operation of a device within this classification is certainly unjust.

Whether the device causes interference through lack of "choke" or "filter" attachments or through improper design, the cure for the interference lies in the education of the manufacturer. Many brands of devices have become specifically known as interference producers and this reputation is compelling manufacturers to improve their construction. Already a large number of such appliances carry the guarantee of the maker that they will not produce interference with radio reception. The importance of the work along this line of trades associations has been tremendous and the time will soon arrive when this type of interference will no longer exist.

In many cities, however, ordinances of general application have been enacted where the real purpose has been to reach individual offenders who knowingly and persistently operate interference-producing devices of wide effect, refusing to attach corrective apparatus or to make repairs.

As to such persons, ordinances are valid if reasonable. In such applications, the ordinances are in nowise burdens on interstate commerce but are rather in aid thereof. They come within the power of the State to prevent and abate nuisances.

(See *Georgetown v. Alexandria Canal Co.*, 12 Pet. 91.)

An ordinance drawn for such a purpose should be so phrased as to be inapplicable to persons not guilty of either wilful or negligent disregard of the radio reception rights of the community. A specimen of such ordinance is attached hereto as Appendix A. It is not offered as a "model" ordinance, but rather as a general ordinance which may be changed to cover existing conditions which vary with different cities. It represents the limit to which the municipality may constitutionally go in this matter.

Speaking generally, the problem of interference from nonradio devices is one to be solved by cooperation and the exchange of information between utilities, manufacturers, listeners' organizations, and trades associations rather than by legislation.

There is little to be gained by the enactment of ordinances imposing different standards in the various communities and which delegate the handling of the interference problem to municipal enforcement officers who are possibly unfamiliar with it.

Speaking over radio station WFBM on April 26, 1927, Mr. Andrew J. Allen, secretary of the Indianapolis Broadcast Listeners' Association, said:

The officers of the Indianapolis Broadcast Listeners' Association view with disfavor and alarm the dangerous and disorganizing tendency shown by the radio listeners in some cities in resorting to ill-advised methods in the effort to prevent radio interferences which could be located and remedied through cooperation among the listeners themselves. Laws and city ordinances that are more destructive than constructive work needless hardship and injustice to users of electrical power and appliances in the household, and in business and professional institutions, as well as to the electric service and utility companies.

B. LAWS FOR THE CONTROL OF LOUD-SPEAKER OPERATION

The operation of loud speakers so as to annoy or disturb the owner or occupant of adjoining property, or those who live in the community, has been declared a nuisance, and such operation has been enjoined by a Massachusetts

court and upheld by the Supreme Court of that State in *Stodder v. Rosen Talking Machine Co.* (247 Mass. 60, 141 N. E. 569).

Such a law is purely local in its character and effect. The States have the authority under the police power to regulate local nuisances or to prohibit the operation of such apparatus if the operation thereof becomes a nuisance.

There is appended (Appendix B), an ordinance which may be suggested for municipalities desiring legislation of this character.

III. LAWS DEALING WITH APPARATUS CONSTRUCTION

A. AS TO TOWERS, POLES, GUY WIRES, ANTENNAS, ETC.

B. AS TO WIRING

There are many hazards in the use of radio apparatus. Poorly constructed towers may collapse and destroy life and property. Antennas may break and come into contact with high potential circuits, leading death into the household. Poorly constructed or unprotected wire lines are electrocution and fire hazards.

There is much legislation dealing with these dangers. Such legislation is valid when reasonable and not in conflict with legislation of the Federal Government. (*New York, New Haven & Hartford Railroad Co. v. New York*, 165 U. S. 628 (1897).) In radio matters there is no national legislation of this character, nor does it appear that it is of such a nature as to indicate the desire of Congress that it shall be uncontrolled. It is plain, however, that with reference to apparatus used in radio transmission, the municipality would not have the power to prevent, by ordinance, the type of construction reasonably necessary for the station to transmit to the full extent of its Federal license.

CONCLUSION

The development of each of the major instrumentalities of interstate commerce in the United States has been accompanied by long and expensive quarrels over the power to regulate them. Thousands of ordinances have been enacted only to be found invalid or unwise. If radio communication is now to traverse the same route, a vital element in the national development will be handicapped. Radio by its physical nature is the most nation-wide of all our commercial agencies. Equally it is the most sensitive to regulation. The guiding principle of attempted local control should be extreme caution.

APPENDIX A

AN ORDINANCE PROHIBITING ELECTRICAL INTERFERENCE WITH RADIO RECEPTION, AND PROVIDING FOR PUNISHMENT FOR THE VIOLATION THEREOF

Be it ordained by

SECTION 1. That it shall be unlawful for any person, firm, copartnership, association, or corporation knowingly or wantonly to operate or cause to be operated, any machine, device, apparatus, or instrument of any kind whatsoever within the corporate limits of the city of, between the hours of o'clock, .. m., and 12 o'clock midnight, the operation of which shall cause reasonably preventable electrical interference with radio reception, within said municipal limits: *Provided, however,* That X-ray pictures, examinations, or treatments may be made at any time if the machines or apparatus used therefor are properly equipped to avoid all unnecessary or reasonably preventable interference with radio reception and are not negligently operated.

Sec. 2. That this ordinance shall not be held or construed to embrace or cover the regulation of any transmitting, broadcasting or receiving instrument, apparatus, or device used or useful in interstate commerce or the operation of which instrument, apparatus, or device is licensed or authorized by or under the provisions of any act of the Congress of the United States.

Sec. 3. That every person, copartnership, association, firm, or corporation violating any of the provisions of this ordinance shall, upon conviction, be punished by fine of not less than dollars nor more than dollars, or by imprisonment in the city jail for not less than days nor more than days, or by both such fine and imprisonment. Each day during which such violation continues shall constitute a separate offense.

Sec. 4. That this ordinance shall take effect, etc. (here follow requirement of State laws).

APPENDIX B

AN ORDINANCE PROHIBITING THE OPERATION OF MECHANICAL DEVICES, MACHINES, APPARATUS, OR INSTRUMENTS TO INTENSIFY OR AMPLIFY THE HUMAN VOICE OR ANY SOUND OR NOISE BY WHICH THE PEACE OR GOOD ORDER OF THE NEIGHBORHOOD IS DISTURBED OR PERSONS OWNING, USING, OR OCCUPYING PROPERTY IN THE NEIGHBORHOOD ARE DISTURBED OR ANNOYED

Be it ordained by

SECTION 1. That it shall be unlawful for any person, copartnership, association, firm, or corporation knowingly or wantonly to use or operate, or to cause to be used or operated, any mechanical device, machine, apparatus, or instrument for intensification or amplification of the human voice or any sound or noise in any public or private place in such manner that the peace and good order of the neighborhood is disturbed or that persons owning, using, or occupying property in the neighborhood are disturbed or annoyed.

Sec. 2. That every person, copartnership, association, firm, or corporation violating any of the provisions of this ordinance shall, upon conviction, be punished by fine of not less than dollars nor more than dollars, or by imprisonment in the city jail for not less than days nor more than days, or by both such fine and imprisonment. Each day during which such violation continues shall constitute a separate offense.

Sec. 3. That this ordinance shall take effect, etc. (here follow requirement of State laws).

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**END OF
TITLE**